



*Dr. R.N. O'Brien and Technician Peter Smits observe hatching salmon eggs.*

*Eggs are lined up on tiny trough before hatching begins.*



## FISH MIDWIFERY

On the subject of salmon, the interest of Dr. R.N. O'Brien (Chemistry) lies neither in steak nor eggs, but in the transitional process between the two.

Assisted by technician Peter Smits, Dr. O'Brien uses an interferometer to measure the amount of oxygen consumed by salmon eggs during the hatching process.

Observed by means of a laser and recorded on a motion picture camera, the tiny trough of approximately half a dozen eggs inside the interferometer produces a contour of oxygen concentration.

"By solving the proper differential equation," Dr. O'Brien explained, "this will give us the amount of oxygen being consumed."

"The results can be used to determine how many fish can spawn in one river area without overloading."

Because the experiment is dependent on the spawning habits of the various types of salmon, observations using salmon eggs can only be conducted once in December (with Sockeye eggs) and in January (with Chum eggs).

And although a couple of hundred eggs are obtained for each attempt, the number of observations are strictly limited.

"The problem is that all the eggs hatch at once so we only get about three tries," Dr. O'Brien said.

Approximate hatching time can be determined by the temperature of the water in which the eggs are kept.

Once in the interferometer, they are observed by Mr. Smits for about one hour. Meanwhile, he conducts time lapse photography at five minute intervals using a total of about 100 feet of film.

"Through experience, we know that one hour is the maximum oxygen usage period," Dr. O'Brien said. "We photograph them right before hatching, when the struggle uses the most oxygen."

Pressure inside the interferometer equals one atmosphere plus one pound.

"We can simulate the pressure at the



depth of the continental shelf," Dr. O'Brien said, "But this would be applied if we were using halibut eggs."

As far as Dr. O'Brien is aware, he and Mr. Smits are the only persons in the world to conduct the experiment. But assistance comes from many other quarters of the university, and the Nanaimo Biological Station which supplies the eggs and the data on them.

"We are not biologists and we need the help of biologists — they give it willingly, including the use of their stream tank."

Help also comes from aquarists, bacteriologists, and biochemists.

"We do the central experiment on the chemistry of oxygen demand and they provide all the peripheral support to enable us to do it."

Dr. O'Brien's laboratory is secure in its claim to be the biggest chemical interferometry lab in the world — which isn't very big because not too many chemists are doing interferometry."

In the chapter on interferometry which he wrote for the *Techniques of Organic Chemistry* series, Dr. O'Brien found it was largely a case of "O'Brien citing O'Brien".

"Of the total literature in this area we have probably published 30 to 40 papers, and another 30 to 40 have come from labs in all the rest of the world. Nobody is as serious about it as we are."

Interferometry is a specialized form of refractometry which measures the refractive index and thereby provides a means of analyzing the concentration of the solution.

"The general idea is, a non polar gas like oxygen causes a decrease in the refractive index; most other gases cause an increase. These changes are very small, therefore we need elaborate equipment."

Dr. O'Brien now has about 12 interferometers being used for various purposes.

We had to build all our own material. It was done in the machine shop here — the technicians deserve a lot of credit.

"My grad students and I designed one interferometer and it was built to our specifications."

Dr. O'Brien's interest in interferometry is steadily growing.

"Every time we think we have found all you can do with interferometry we find something else."

But Dr. O'Brien still has to figure out what to do with several hundred thriving young salmon.

"I suppose we'll feed them until they're big enough to chuck off welfare and into the ocean to make their own way.

"The hatching of the eggs was our main interest, but we just didn't have the heart to flush them down the toilet."

## PRINT MAKER VISITS

Mr. Tony Urquhart, print maker from the University of Waterloo, will be visiting the Department of Visual Arts on February 18 to 20.

He will be giving a lecture Monday, February 18 at 12:30 p.m. in Elliott 168 on "How the Opening Boxes Started to Open". Those interested in meeting Professor Urquhart are urged to get in touch with the Department.

## PART-TIME CREDIT JUMPS

Part-time credit enrolment at the University showed the largest single increase in the history of the University during the current Winter Session, 1973-74. Official University figures show a total of 1298 part-time credit students currently registered, an increase of 443 or 51% over 1972-73 official figures of 855.

As shown in the table below part-time enrolment has grown steadily over the past 5 years.

### Part-time Credit Enrolment: 1969-1974

1973-74	1298
1972-73	855
1971-72	827
1970-71	655
1969-70	664

The large increase in the current year is attributed by Dr. L.E. Devlin, Director of Continuing Education, to an increased number of Arts and Science courses scheduled in the evening hours by the Faculty. "The Faculty of Arts and Science at Victoria currently offers more credit courses in the evening than does the same Faculty at the University of British Columbia, despite its much smaller size." The Faculty of Fine Arts also increased its evening offerings in the current session.

Also influencing growth of part-time student enrolment this year was an expansion of off-campus credit offerings, particularly in Education, to 16 courses from 7 in 1972-73. The University currently

offers courses in Duncan, Port Alberni, Nanaimo and Courtenay.

Publication of a separate Evening Credit Calendar in June also helped acquaint part-time students identify appropriate University offerings, said Dr. Devlin. The University regularly published such a Calendar until 1968 for Evening Division Students. Publication of the Calendar was reinstituted by the Division of Continuing Education in 1973-74.

A newly established Senate Committee on Continuing Education is beginning to examine the question of part-time credit study at the University. At present, it is still difficult for students in evening credit courses to follow a coherent degree program as fewer than 10% of all University credit courses are scheduled for the evening hours.

Plans are underway to expand 1974-75 evening credit courses over the present level in response to increased enrolment this year. "There are many hundreds of qualified University applicants whom we are still not reaching because they are unable to register for credit courses offered in the day," Dr. Devlin said.

"The planned expansion of offerings in 1974-75 should help such individuals proceed toward a degree."

## B.C. SYMPOSIUM

Power and conflict in British Columbia will be the theme of a public symposium to be held on the UVic campus February 23 and 24.

Sponsored by the Canadian Sociology and Anthropology Association, the symposium is one of a series to be held across the country this year with the aim of "defining and exploring Canadian social issues."

Four UVic faculty members will participate in the symposium including Dr. Walter Young (Political Science) who will be chairman of the *Parties and Power* session.

Presenting papers at this session, which will be held from 10:45 a.m. to 1 p.m. February 24 in the SUB will be Dr. Daniel Koenig (Anthropology); Gary Martin and Dr. Norman Ruff (Political Science).

Dr. Koenig's paper will be on the Correlates of B.C. Party Migrants in the 1972 Election. Mr. Martin's paper will be on Political Alienation and 1972 Political



Party Preference in B.C. Dr. Ruff will speak on A Profile of Provincial Party Activists; Preliminary Analysis of Three Conventions, November 1973.

"The purpose of the symposium is to encourage more studies of B.C. society," Dr. Ruff said.

"One discussion will be on what the government expects of social scientists. There is a moral issue here — the conflict between making recommendations to the government and to what use politicians will put the recommendations."

A central question at the conference, Dr. Ruff said, is whether social scientists are able to offer relevant skills to the government.

The conference begins at 9 a.m. Saturday, February 23 with coffee and opening remarks until 10 a.m. From 10 a.m. to 1 p.m. will be the Community and Power Session with a panel and paper presentations dealing with case studies in community conflict and power in company towns.

From 2 to 5 p.m. the *Groups and Power* Session will deal with the relationships between power and ethnic groups, labour, business interest groups, women and the media.

The first Sunday session, from 9:30 a.m. to 10:45 a.m. will discuss *Universities and Power* to be followed by the Parties and Power Session.

From 2 to 4 p.m. a panel discussion/debate is scheduled on the relationships between social scientists and the government.

Dr. Ruff is expecting both the audience and the participants in the symposium to come from throughout the province.

"A number of people will be here from company towns, and we're expecting between 100 and 300 from Vancouver."

Faculty members wishing to assist in billeting of UBC and SFU participants can contact Cynthia Brand at 479-5792.

All members of the University community, the public and especially the university community, the government and the press are welcome at the symposium.

## ORAL EXAMINATIONS

Members of the Faculty of Graduate Studies are invited to attend three oral examinations within the next week.

The oral examination of M.A. Candidate Mr. John Hedley will be held Friday, February 15, in room 49 of the Sedgewick



UVic President H.E. Farquhar presents a book on British Columbia wildflowers to the Ambassador of Japan to Canada, His Excellency Akira Nishiyama. The Ambassador spoke to students on "The Japanese Posture in International Relations" February 7.

Building. Mr. Hedley's thesis is "A 15th Century Middle English Poem 'The Craft of Lovers', an Edition".

The oral examination of M.A. candidate Mr. Ronald William Wickstrom will be held at 3 p.m. Friday, February 15 in room 306 Clearihue Building. His thesis is "A Phonology of Gitskan with Emphasis on Glotalization".

The oral examination of M.Sc. Candidate Mr. Kent Steven Simpson will be held at 10:30 a.m. Monday, February 18 in room 0015, Cunningham Building. Mr. Simpson's thesis is entitled "Orientation Differences Between Populations of Juvenile Sockeye Salmon".

Copies of Mr. Hedley's thesis will be available from the English Department secretary. Copies of Mr. Wickstrom's thesis will be available from the Linguistics Department secretary. Copies of Mr. Simpson's thesis will be available from the Biology Department secretary. The copies must be returned to these offices no later than the morning of the respective examinations.

The oral examination of Miss Elizabeth Ann Dixon, Ph.D. candidate in Chemistry, was held Thursday, February 14. Miss Dixon's dissertation was "Synthesis and 19F Nuclear Magnetic Resonance Studies of Substituted Fluoromethylnaphthalenes."

## RETIREMENT DATE SET

Dr. H.E. Farquhar will retire as President June 30.

In September 1973, Dr. Farquhar announced that he had asked the Board of Governors to take action to, "bring in nominations for President of the University", but no date for his retirement was given at that time.

A committee to search for a new president was set up in October of last year and the position has been advertised.

In a letter to S.J. Cunliffe, Chairman of the Board of Governors, Dr. Farquhar said it was his intention to, "resign as President of the University of Victoria effective June 30, 1974."

The date corresponds with the end of the university's 1973-74 academic year.

Dr. Farquhar had retired in 1970, but returned in 1971 at the request of the University to become Dean pro tem of the Faculty of Education, and in 1972 at the request of the Board of Governors, took on the duties of President.

The retirement date was made public this week by Mr. Cunliffe, who is also Chairman of the Search Committee. He said the Committee is proceeding as quickly as possible to fill the post.



## MEMENTOES SOUGHT

The UVic Alumni Association is seeking interesting items pertaining to the history of Victoria College or the university.

The association is hoping to collect old photographs, trophies and other mementoes to be used as part of an exhibition at the UVic Open House March 9 and 10.

Especially requested are old 16mm or 8mm films, which could be borrowed for long enough to be copied for the University Archives.

Former students who have any material that would be useful are asked to contact the Alumni Association at 477-6911/588 or visit the Alumni Office in F Hut.

## Coming Events

### FRIDAY, February 15

- 12:30 pm Music at Noon. MacLaurin 144.
- 12:30 pm Lecture, Department of Biology. Cunningham 1102. Dr. Roger Green, University of Manitoba will speak on "The Assessment of Environmental Factors Controlling Species Composition in Aquatic Communities".
- 3:30 pm Lecture, Department of Psychology. Cornett 170. Dr. John Scull will present some of the findings from his most recent research. Dr. Scull is a Psychologist at Cedar Lodge Residential Centre for boys, Cobble Hill, B.C.
- 6:30 pm Women's Basketball. UVic Gymnasium. Albert vs Victoria
- 7:15 pm Cinecenta films. MacLaurin 144. "Bedazzled" with Raquel Welch. Students & Staff—\$.75; General Public—\$1.25.
- 8:30 pm Men's Basketball. UVic Gymnasium. Alberta vs Victoria.

### SATURDAY, February 16

- 1:00 pm Women's Field Hockey. Beacon Hill. Vikettes vs Mariners.
- 1:00 pm Rugby. Gordon Head. CFB vs Norsemen.
- 2:15 pm Soccer. Centennial Stadium. UVic vs London Boxing.
- 2:30 pm Rugby. Windsor Park. Vikings vs OBW.
- 6:30 pm Women's Basketball. UVic Gymnasium. Alberta vs Victoria.
- 7:15 pm Cinecenta films. MacLaurin 144. "Bedazzled", with Raquel Welch. Students & Staff—\$.75; General Public—\$1.25.
- 8:30 pm Men's Basketball. UVic Gymnasium. Alberta Vs Victoria.

### SUNDAY, February 17

- 1:00 pm Rugby. Gordon Head. JBAA vs Saxons.

### MONDAY, February 18

- 12:30 pm Lecture, Department of Visual Arts. Elliott 168. Mr. Tony Urquhart will speak on "How the Opening Boxes Started to Open".

### TUESDAY, February 19

- 4:30 pm Music. MacLaurin 144. Voice Performance Majors' Class: Excerpts from Mozart's "The Magic Flute".
- 6:30 pm Women's Basketball. UVic Gymnasium. University of Winnipeg vs UVic.
- 7:30 pm CUPE Workshop. Cornett 108.
- 7:30 pm Lectures, Department of Bacteriology and Biochemistry. Lansdowne 117. "Insect Moulting" Mr. Chow-Kee Chung, First Year Student, Honours Biochemistry, Department of Bacteriology and Biochemistry, UVic. "Space Medicine", Miss Verna Lang, First Year Student, Honours Biochemistry, Department of Bacteriology and Biochemistry, UVic.
- 8:00 pm Faculty and Staff Badminton. UVic Gymnasium.
- 8:30 pm Men's Basketball. UVic Gymnasium.

### WEDNESDAY, February 20

- 4:30 pm Lecture, Creative Writing Department. Mr. Peter Russell will speak on "Cosmogony, Ritual and the Desacralisation of Words and Music".
- 7:00 pm Faculty and Staff Chess. Clearihue 128.
- 7:30 pm Senate Meeting. Cornett 112.

## Next Deadline

Friday, One week before publication

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### THURSDAY, February 21

- 12:30 pm Lecture, Faculty of Fine Arts and the Department of History in Art. MacLaurin 144. Last of three lectures by Colin G. Graham on "Canadian Painting in the Twentieth Century".
- 8:00 pm Lectures, Classics Department. MacLaurin 103. Professor B.H. Warming-ton will speak on "Constantine's Pace in History". He is a visiting professor of classics at Brock University in Ontario.
- 9:40 pm Cinecenta films. MacLaurin 144. "Adventures of Goopy & Bagha". Students and Staff—\$.75; General Public—\$1.25.

### FRIDAY, February 22

- 12:30 pm Music at Noon. MacLaurin 144. University of Victoria Brass Ensemble, Boyde Hood, Director.
- 7:15 pm Cinecenta films. MacLaurin 144. "Psycho" and "The Wrong Man", two films by Hitchcock. Students and Staff—\$.75; General Public—\$1.25.
- 8:00 pm Lecture, Classics Department. MacLaurin 103. Professor B.H. Warming-ton will speak on "Some Cities of Rome and North Africa".

### SATURDAY, February 23

- 1:00 pm Rugby. Gordon Head. University of Washinton vs Norsemen.
- 2:30 pm Rugby. Centennial Park. University of Washington vs Vikings.
- 2:45 pm Women's Field Hockey. UVic. UVic Vagabonds vs Rebels Red.

### SUNDAY, February 24

- 1:00 pm Rugby. Cowichan. Saxons vs Cowichan.
- 2:15 pm Soccer. Athletic Park. Lusitanos vs UVic.

AROUND THE RING  
UNIVERSITY OF VICTORIA NEWSLETTER  
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